

CLAIMS

1. A high purity source chemical container assembly, comprising; a high purity source chemical container, at least one inlet to the interior of the source chemical container, at least one outlet from the interior of the source chemical container, at least
5 one source chemical solvent ampoule integral to said assembly, at least one inlet to the interior of the source chemical solvent ampoule, at least one outlet from the interior of the source chemical solvent ampoule, at least one solvent capture ampoule integral to said assembly sized to accommodate source chemical solvent from said source chemical solvent ampoule, and at least one orifice communicating with the interior of the
10 solvent capture ampoule.
2. The assembly of Claim 1 wherein the source chemical solvent ampoule and the solvent capture ampoule comprise a single baffled ampoule.
- 15 3. The assembly of Claim 1 wherein the source chemical solvent ampoule is inside said high purity source chemical container and said inlet to the interior of the source chemical solvent ampoule and said outlet from the interior of the source chemical solvent ampoule access an exterior of said high purity source chemical container.
- 20 4. The assembly of Claim 1 wherein the solvent capture ampoule is inside said high purity source chemical container and said orifice communicating with the interior of the solvent capture ampoule accesses an exterior of said high purity source chemical container.

- A
Cont'd.*
5. The assembly of Claim 1 wherein said assembly has a chime ring bracket on an exterior of said high purity source chemical container.
6. The assembly of Claim 5 wherein said source chemical solvent ampoule is integral to said chime ring bracket.
7. The assembly of Claim 5 wherein said solvent capture ampoule is integral to said chime ring bracket.
- 10 8. The assembly of Claim 1 wherein said high purity source chemical container has a diptube connected to said outlet and extending to a point adjacent a bottom of said high purity source chemical container.
- 15 9. The assembly of Claim 1 wherein said high purity source chemical container has a level sensor communicating with an exterior of said container and extending to a point adjacent a bottom of said high purity source chemical container.
- 20 10. The assembly of Claim 9 wherein said level sensor is selected from the group consisting of a float level sensor, an ultrasonic level sensor, a capacitance level sensor, an optical level sensor and combinations thereof.
11. The assembly of Claim 1 wherein said inlet and said outlet of said high purity source chemical container each have a valve for controlling flow of pressurizing fluid or high purity source chemical, respectively.

- (A) Contd*
12. The assembly of Claim 11 wherein said valve is selected from the group consisting of a pneumatic valve, a solenoid valve, a manual valve and combinations thereof.
- 5 13. The assembly of Claim 1 wherein said source chemical solvent ampoule has a diptube connected to said outlet of said source chemical solvent ampoule and extending to a point adjacent a bottom of said source chemical solvent ampoule.
- 10 14. The assembly of Claim 1 wherein said inlet to said high purity source chemical container is connected to a source of pressurizing inert gas.
- 15 15. The assembly of Claim 1 wherein said inlet to said source chemical solvent ampoule is connected to a source of pressurizing inert gas.
- 15 16. The assembly of Claim 1 wherein said source chemical solvent ampoule contains a solvent under pressure without connection to an external source of pressure.
17. The assembly of Claim 1 wherein said solvent capture ampoule has two orifices.
- 20 18. The assembly of Claim 17 wherein one of said orifices of said solvent capture ampoule is connected to one of a low pressure vent or source of vacuum.
19. The assembly of Claim 1 wherein the interior of said solvent capture ampoule is under vacuum without connection to a source of vacuum.

*W
CNS*

20. The assembly of Claim 1 wherein said assembly has a quantity of high purity source chemical contained in said high purity source chemical container selected from the group consisting of tantalum pentaethoxide (TAETO), tetrakis(diethylamino) titanium (TDEAT), tetrakis(dimethylamino) titanium (TDMAT), tetramethylcyclotetrasiloxane (TMCTS), copper hexafluoroacetylacetone- trimethylvinylsilane (Cu(hfac)TMVS), tetraethylorthosilicate (TEOS), trimethylborate (TMB), triethylborate (TEB), trimethylphosphite (TMPi), triethylphosphate (TEPO), bistertiarybutylaminosilane (BTBAS), tantalumtetraethoxidedimethylaminoethoxide (TAT-DMAE), t-butylimidotrisdiethylamido tantalum (TBTDET), triethyl arsenite (TEOA), polyarylene ethers and mixtures thereof.

21. The assembly of Claim 1 wherein said assembly has a quantity of source chemical solvent contained in said source chemical solvent ampoule selected from the group consisting of organic alcohols such as methanol, ethanol, propanol, butanol, acetone, tetrahydrofuran, dimethylsiloxane, water, aliphatic hydrocarbons such as hexane, heptane, octane, decane, and dodecane, aromatic hydrocarbons, ketones, aldehydes, hydrocarbons, ethers, esters, glymes, aromatic hydrocarbons, halogen containing alcohols, alkyl nitriles, alkanols, organic amines, fluorinated compounds, perfluorocarbons such as perfluorohexane and perfluoroheptane and mixtures thereof.

20
22. The assembly of Claim 1 wherein said solvent capture ampoule contains a sorbent for said solvent.

23. The assembly of Claim 1 wherein said solvent capture ampoule contains a sorbent for said solvent and said high purity source chemical.

- A
Cynth
D
G
G
G
G
G
G
G*
24. The assembly of Claim 23 wherein said sorbent is selected from the group consisting of zeolites, aluminosilicates, phosphosilicates, carbon, silica, alumina, molecular sieve, carbon molecular sieve, polymeric adsorbents, polyethylene, 5 polypropylene, resin beds, clays, porous ceramics and mixtures thereof.
25. The assembly of Claim 23 wherein said sorbent renders said solvent and said high purity source chemical non-flammable and/or non-hazardous.
- 10 26. The assembly of Claim 25 wherein said sorbent is a perfluorocarbon.
27. The assembly of Claim 25 wherein said sorbent is a low volatility oil.
- 15 28. The assembly of Claim 1 wherein said high purity source chemical container has a baffle to define two chambers to contain two distinct high purity source chemicals wherein each chamber has at least one inlet to the interior of such chamber and at least one outlet from the interior of such chamber.
- 20 29. The assembly of Claim 28 wherein said high purity source chemical container chambers each have a level sensor communicating with an exterior of said chamber, respectively, and extending to a point adjacent a bottom of said chamber, respectively.
30. The assembly of Claim 1 wherein said source chemical solvent ampoule and said solvent capture ampoule each are affixed to said assembly by a fastening selected from

the group consisting of welding, soldering, bolting, screwing, strapping, bracketing and combinations thereof.

31. The assembly of Claim 1 wherein said source chemical solvent ampoule and said
5 solvent capture ampoule each are affixed to said assembly by an ampoule bracket
integral to said assembly comprising two ampoule bracket sections which interface with
one another to engage each ampoule.
32. The assembly of Claim 31 wherein the engagement is a friction fit of the two
10 ampoule bracket sections with said ampoules.
33. A high purity source chemical container assembly, comprising; a high purity
source chemical container, an inlet to the interior of the source chemical container
having an integral pneumatic valve for connection to a source of pressurizing inert gas,
15 an outlet from the interior of the source chemical container having an integral pneumatic
valve for connection to a manifold to deliver high purity source chemical to a
downstream process using said chemical said outlet having a diptube extending to a
point adjacent a bottom of said source chemical container, at least one source chemical
solvent ampoule integral to said assembly, an inlet to the interior of the source chemical
20 solvent ampoule having an integral pneumatic valve for connection to a source of
pressurizing inert gas, an outlet from the interior of the source chemical solvent ampoule
having an integral pneumatic valve for connection to said manifold which delivers high
purity source chemical to a downstream process, a solvent capture ampoule integral to
said assembly sized to accommodate source chemical solvent from said source
25 chemical solvent ampoule, and an orifice communicating with the interior of the solvent

A. Cettry

capture ampoule to receive source chemical solvent from said source chemical solvent ampoule through said manifold.

34. The assembly of Claim 33 wherein said source chemical solvent ampoule and
5 said solvent capture ampoule each are affixed to said assembly by an ampoule bracket
integral to said assembly comprising two ampoule bracket sections which interface with
one another to engage each ampoule by a friction fit of the two ampoule bracket portions
with said ampoules.
- 10 35. The assembly of Claim 33 wherein said source chemical solvent ampoule
contains a solvent under pressure without connection to an external source of pressure.
- 15 36. The assembly of Claim 33 wherein the interior of said solvent capture ampoule is
under vacuum without connection to a source of vacuum.
37. The assembly of Claim 33 wherein the source chemical solvent ampoule and the
solvent capture ampoule comprise a single baffled ampoule.
- 20 38. The assembly of Claim 33 wherein the source chemical solvent ampoule is
integral to the source chemical container by attachment selected from the group
consisting of a chime ring bracket, the container, a bung, an ampoule bracket and
combinations thereof.
- 25 39. The assembly of Claim 1 wherein the source chemical solvent ampoule is
integral to the source chemical container by attachment to apparatus selected from the

*A
Cont'd.*

group consisting of a chime ring bracket, the container, a bung, an ampoule bracket and combinations thereof.

40. The assembly of Claim 1 wherein said solvent capture ampoule has at least two

5 orifices comprising at least one inlet for solvent entry and at least one outlet to facilitate venting, each orifice having a valve for closing said orifices wherein said valve is selected from the group consisting of pneumatic, manual, electrical, hydraulic, solenoid and combinations thereof, a diptube that extends to near the bottom of the solvent capture ampoule and a level sense selected from the group consisting of floats, optical, 10 capacitive, weight, thermal, or combinations thereof.

41. The assembly of Claim 1 wherein said source chemical solvent ampoule contains a solvent for the high purity source chemical that reacts with the high purity source chemical to create soluble byproducts.

15

42. A high purity source chemical container assembly, comprising; a high purity source chemical container, an inlet to the interior of the source chemical container having an integral pneumatic valve for connection to a source of pressurizing inert gas, an outlet from the interior of the source chemical container having an integral pneumatic 20 valve for connection to a manifold to deliver high purity source chemical to a downstream process using said chemical said outlet having a diptube extending to a point adjacent a bottom of said source chemical container, at least one source chemical solvent ampoule integral to said assembly, an outlet from the interior of the source chemical solvent ampoule having an integral pneumatic valve for connection to said 25 manifold which delivers high purity source chemical to a downstream process, a solvent

A/
Centa

capture ampoule integral to said assembly sized to accommodate source chemical solvent from said source chemical solvent ampoule, having an orifice communicating with the interior of the solvent capture ampoule to receive source chemical solvent from said source chemical solvent ampoule via said manifold.

5

43. A process for cleaning a manifold which delivers high purity source chemical from a high purity source chemical container assembly to a point of use wherein a high purity source chemical container having an inlet to the interior of the source chemical container having an integral pneumatic valve for connection to a source of pressurizing inert gas and an outlet from the interior of the source chemical container having an integral pneumatic valve for connection to said manifold to deliver high purity source chemical to a point of use wherein said outlet has a diptube extending to a point adjacent a bottom of said source chemical container, wherein after delivery of the source chemical to said manifold, the manifold is cleaned by delivering a source chemical solvent from a source chemical solvent ampoule integral to said assembly to said manifold by pressurizing said source chemical solvent ampoule through an inlet to the interior of the source chemical solvent ampoule having an integral pneumatic valve for connection to a source of pressurizing inert gas to deliver said source chemical solvent to an outlet from the interior of the source chemical solvent ampoule having an integral pneumatic valve for connection to said manifold and collecting said solvent and any source chemical carried by said solvent from said manifold in a solvent capture ampoule integral to said assembly sized to accommodate source chemical solvent from said source chemical solvent ampoule through an orifice communicating with the interior of the solvent capture ampoule to receive source chemical solvent from said source chemical solvent ampoule.

*As
Control*

44. The process of Claim 43 wherein the opening and closing of valves and transfer of source chemical and source chemical solvent is controlled by an automated control unit communicating with such valves.

5

00000000000000000000000000000000